

Background

Fulminate liver failure is often fatal and with the current shortage of donor transplant organs, molecular adsorbent recirculating system (MARS) offers a bridging treatment to sustain the patient until a suitable organ becomes available or the native liver recovers. MARS, or liver dialysis, is an extracorporeal detoxification method, used in conjunction with continuous renal replacement therapy (CRRT), in which an albumin dialysis is used to clear protein bound toxins.

Since its approval by the Food and Drug Administration, the University of Kansas Hospital is the first institution in the region and one of only seven in the country to implement this cutting edge therapy.

Purpose

Using an evidenced-based approach to program implementation ensures appropriate selection of candidates for MARS therapy, cost effective and efficient use of resources, and optimal patient outcomes.

MARS Circuit



Description

Program development began with the formation of a multidisciplinary team consisting of a Clinical Nurse Specialist, Nursing Unit Educator and Manager, Critical Care Director, Nephrologist, Intensivist, Liver Transplant Team and a Clinical Pharmacist.

Review of literature was completed and criteria for patient selection was also delineated, resulting in program justification and a capital investment.

Aspects of program formation included: selection of highly qualified critical care nurses, education for all members of the interdisciplinary team, development and implementation of physician orders and charting tools, equipment and supply distribution and an on-call resource plan to support the MARS nurse. Detailed program planning has resulted in successful program implementation.

Outcome & Implications

In November 2010, the first patient to meet criteria was identified and MARS therapy was delivered. Debriefing revealed staff was prepared and support systems functioned smoothly. The most recent patient that received therapy was bridged to transplantation in July 2011. Those receiving therapy have survived despite negative prognostic markers. Substantial improvements in lab results following each therapy session are displayed in Figure 1.

The availability of this therapy provides expanded treatment options and hope for our critically ill liver failure patients.

References

1. Camus, Christophe, Sylvain Lavoue, Arnaud Gacouin, Yves Le Tulzo, Richard Lorho, Karim Boudjema, Christian Jacquelin, and Remi Thomas. "Molecular Adsorbent Recirculating System Dialysis in Patients with Acute Liver Failure Who Are Assessed for Liver Transplantation." *Intensive Care Med* 23 (2006): 1817-825. Print.
2. Grizzard, Dalton. *PrisMARS Therapy Quick Reference Guide*. Gambro Renal Products US. Publication 050810 DG. 8 May 2010. Print.
3. Kantola, Taru, Anna-Maria Koivusalo, Satu Parmanen, Krister Hockerstedt, and Helena Isoniemi. "Survival Predictors in Patients Treated with a Molecular Adsorbent Recirculating System." *World Journal of Gastroenterology* 15.24 (2009): 3015-024. Print.
4. Mitzner, Steffen R., Jan Stange, Sebastian Klammt, Sebastian Koball, Heiko Hickstein, and Emil C. Reisinger. "Albumin Dialysis MARS: Knowledge from 10 Years of Clinical Investigation." *American Society of Artificial Internal Organs* (2009): 498-502. Print.
5. Mohammed, Khuroo S., Khuroo S. Mehnaaz, and Karim L.C. Farahat. "Molecular Adsorbent Recirculating System for Acute and Acute-on-Chronic Liver Failure: A Meta-analysis." *Liver Transplantation* 10.9 (2004): 1099-106. Print.

